

Inventions & Innovation Project Abstract

Advanced Process Heater for Steel, Aluminum, and Petroleum Industries of the Future

The Roadmap for Process Heating Technology (March 16, 2001) identified the following priority R&D needs: Improved performance of high-temperature materials, including alloy composite; Improved methods for stabilizing low-emission flames; Heating technologies that simultaneously reduce emissions, increase efficiency, and increase heat transfer". STORM Development, LLC is working with Penn State University and three materials companies' products: (1) Schunk-INEX's Composite Radiant U-Tube (2) SyCore's Silicon Graphite Insert (3) Blasch Precision Ceramics' multi-pass heat exchanger. These products combined with STORM's Fin Stabilized Combustion and an advanced control system will address these R&D needs. This team will be the first to combine the most advanced radiant tube heat transfer components in one high performance package for industries (Steel, Aluminum, & Petroleum) requiring high performance heating.

By using time-proven inexpensive composite material technology, the Advanced Process Heater (APH) will exceed current technology by: (1) Doubling the heat transfer rates (2) Improving thermal efficiencies by 20% (3) Improving temperature uniformity by 50°F to 100°F and (4) simultaneously reducing NOX and CO2 emissions. Once fully commercialized, the APH is expected to save 9.7 trillion BTUs of energy annually in the U.S. and process 1,500,000 tons more material annually without major capital equipment expenditures.



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